TestConX 中国™ China

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Navigating Market Shifts: The Future of Test and Burn-In Sockets in the AI Era.

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- Processor Market Overview
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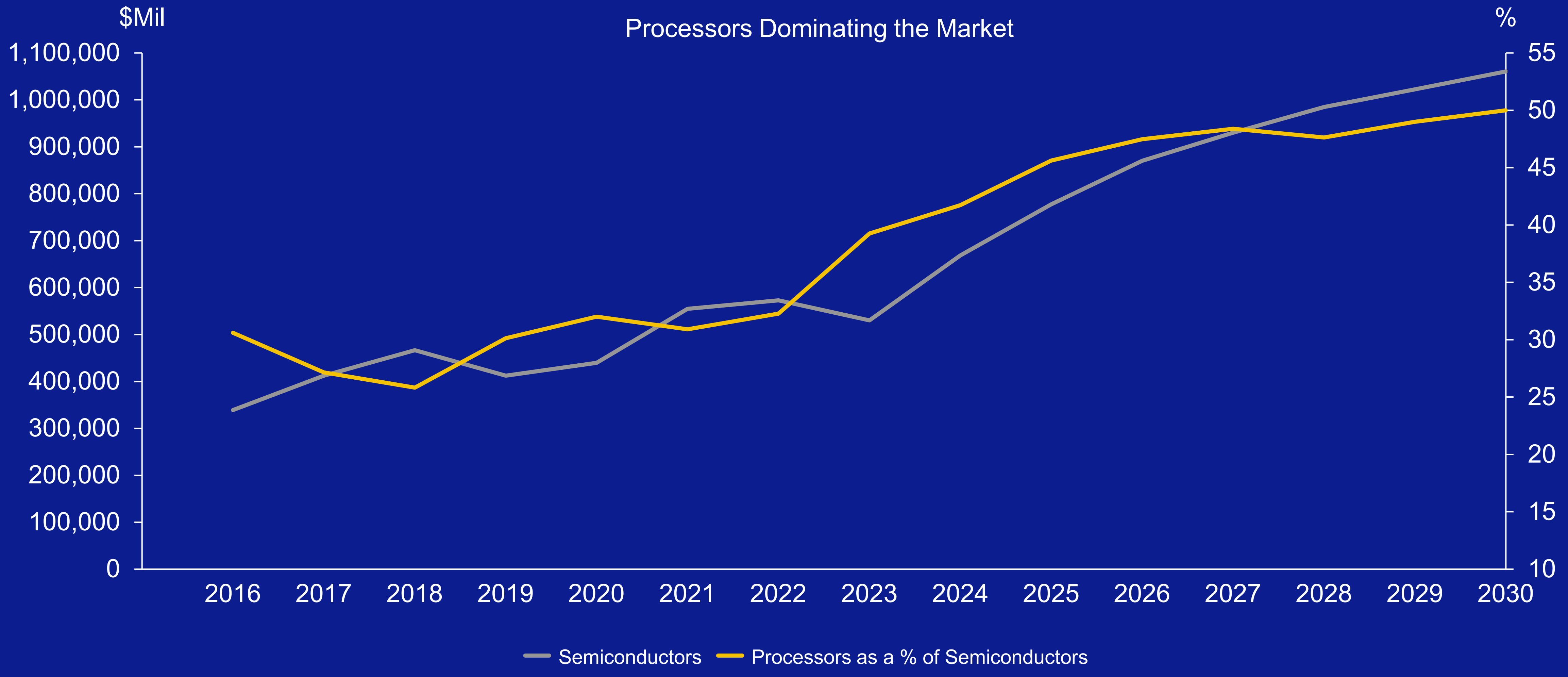
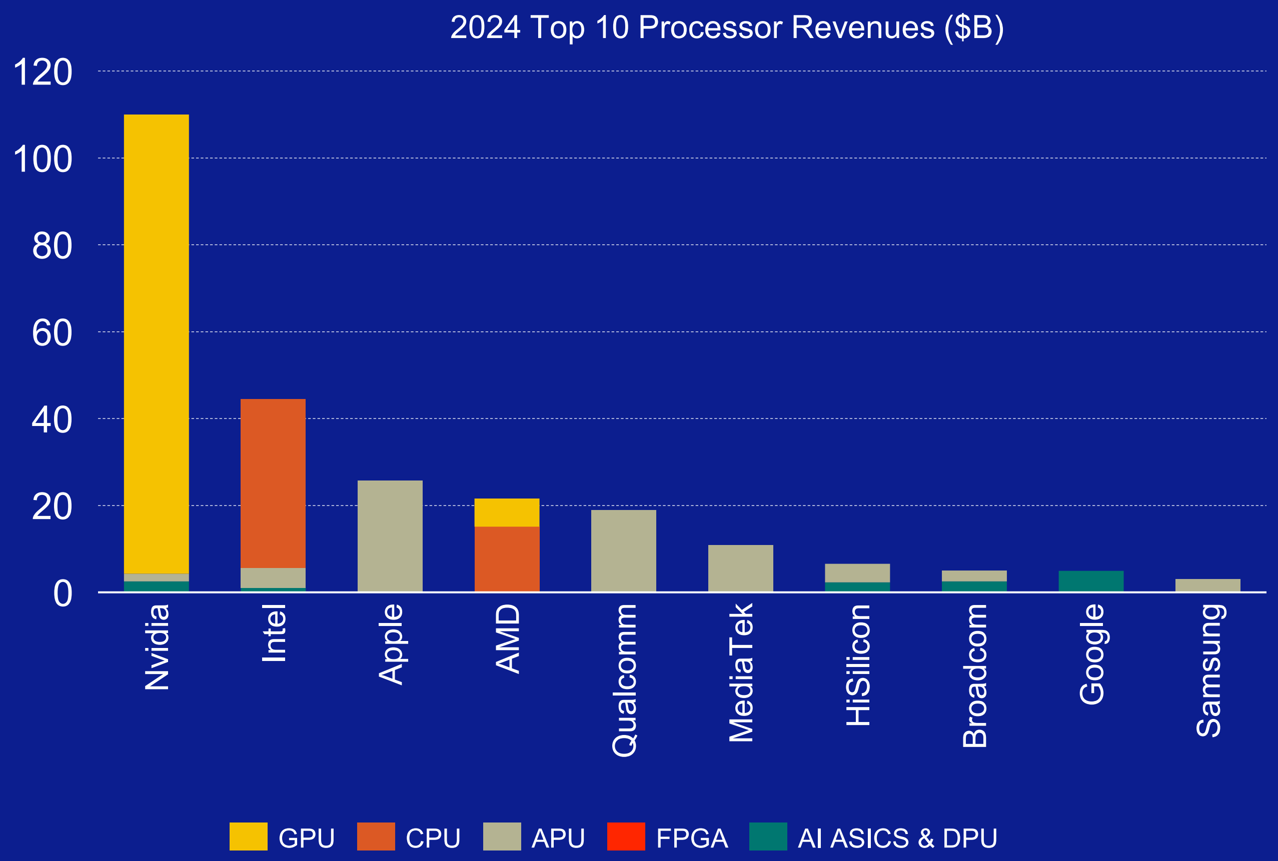
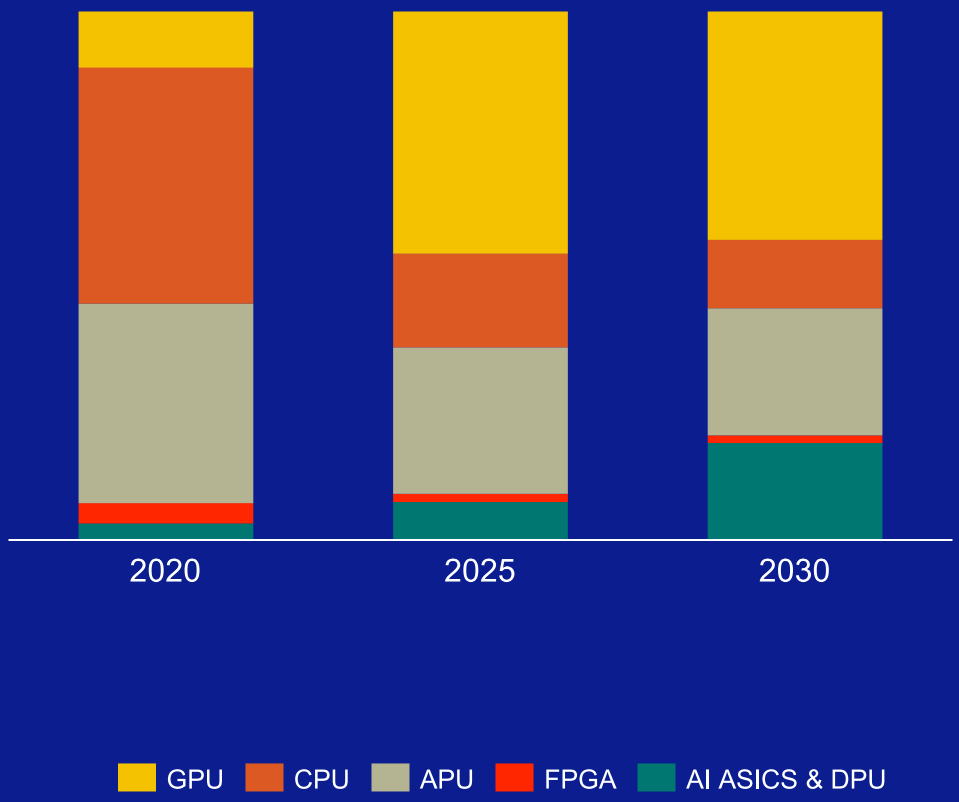
AI Impact on Semiconductors



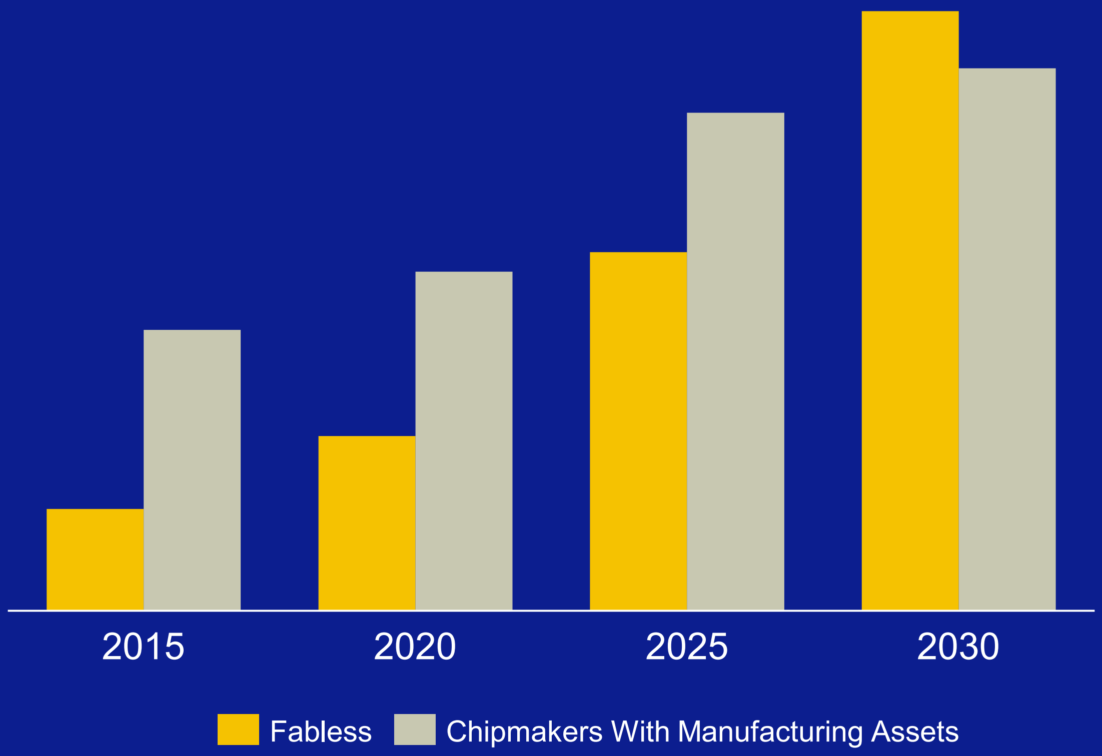
Yole’s Processor Market Overview





It’s a Fabless World

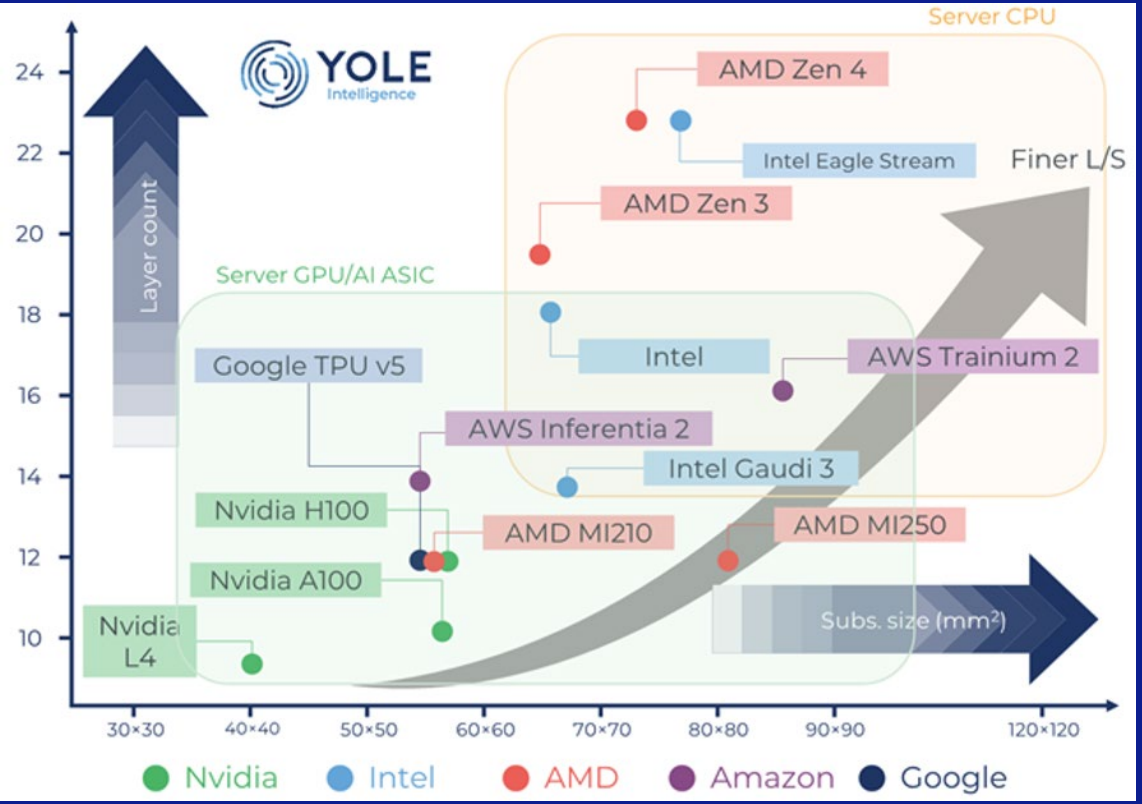
Fabless becoming more important

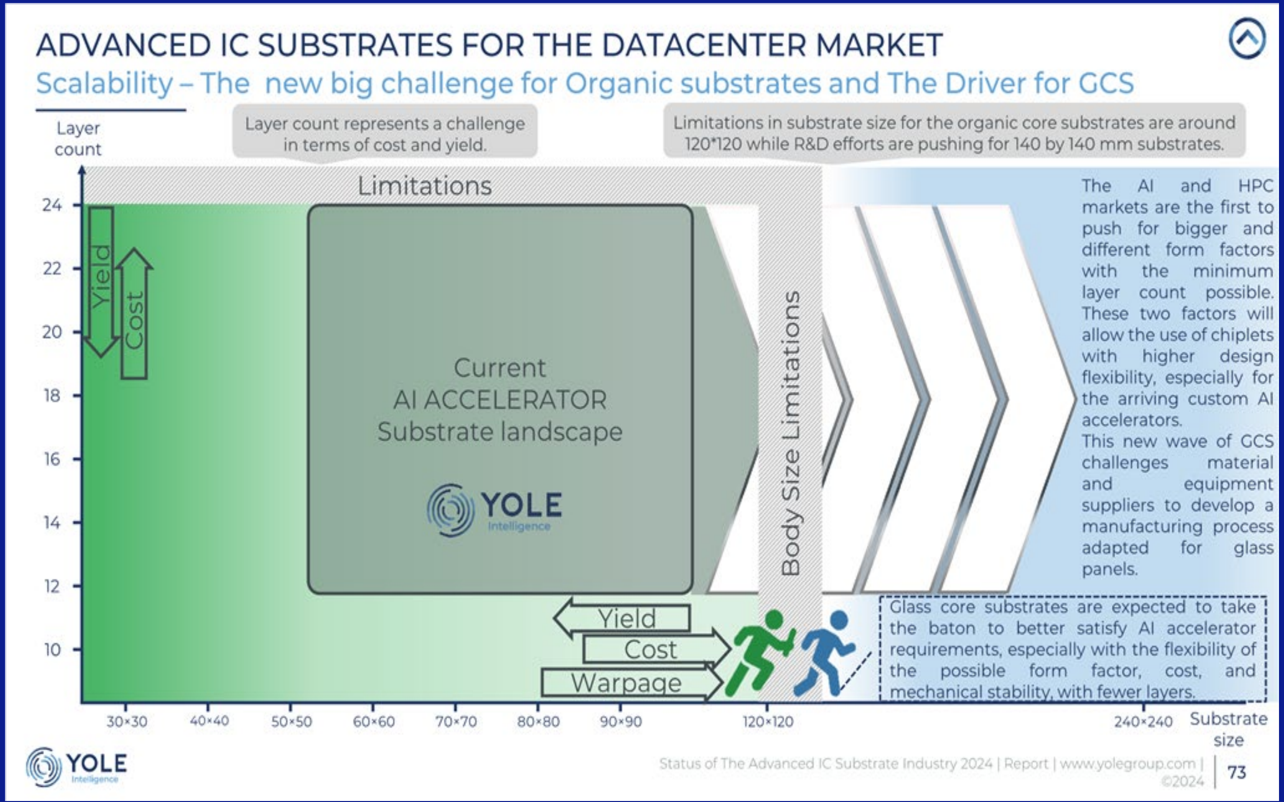


Key Dynamics:

- Fabless dominating the industry.
- Customer base changing over time.

Advanced IC Package/Substrate Trend

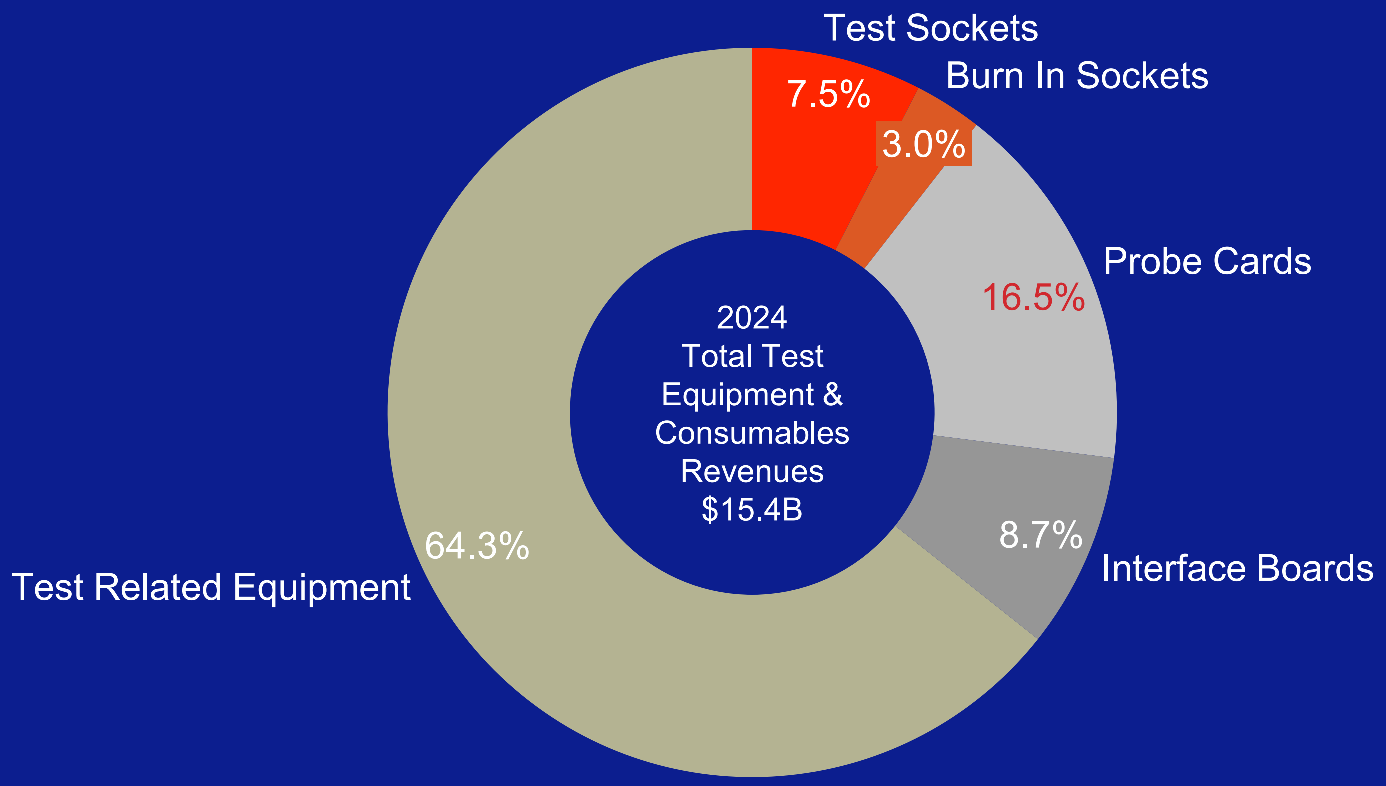




Key Dynamics:

- Higher number of layer counts in substrate indicates higher complexity in testing.
- Advanced packaging pushing towards body size limitations – socket suppliers must be cautious on new advancement to be competitive

Overall Cost of Test Equipment & Consumables



Key Dynamics:

- Test & Burn-in Sockets hold 10.5% of total test equipment and consumables costs in 2024. and falling to 9.6% by 2030
- 4.1% compound annual growth rate (CAGR) for sockets from 2025 to 2030
- Overall test equipment and consumables market growing at a CAGR of 4.7% and reaching a value of $23Bn in 2030
- Test costs do not scale in the same way as investments in wafer fab equipment or advanced packaging
- Data analytics – not included but a growing cost

Long-Term Evolution of Test & Burn-in Socket Sales, $Mil

Test Sockets:

Point of inflection in 2016 due to longer test times, larger packages & higher pin counts, and increased use of System Level Test

Burn-in Sockets:

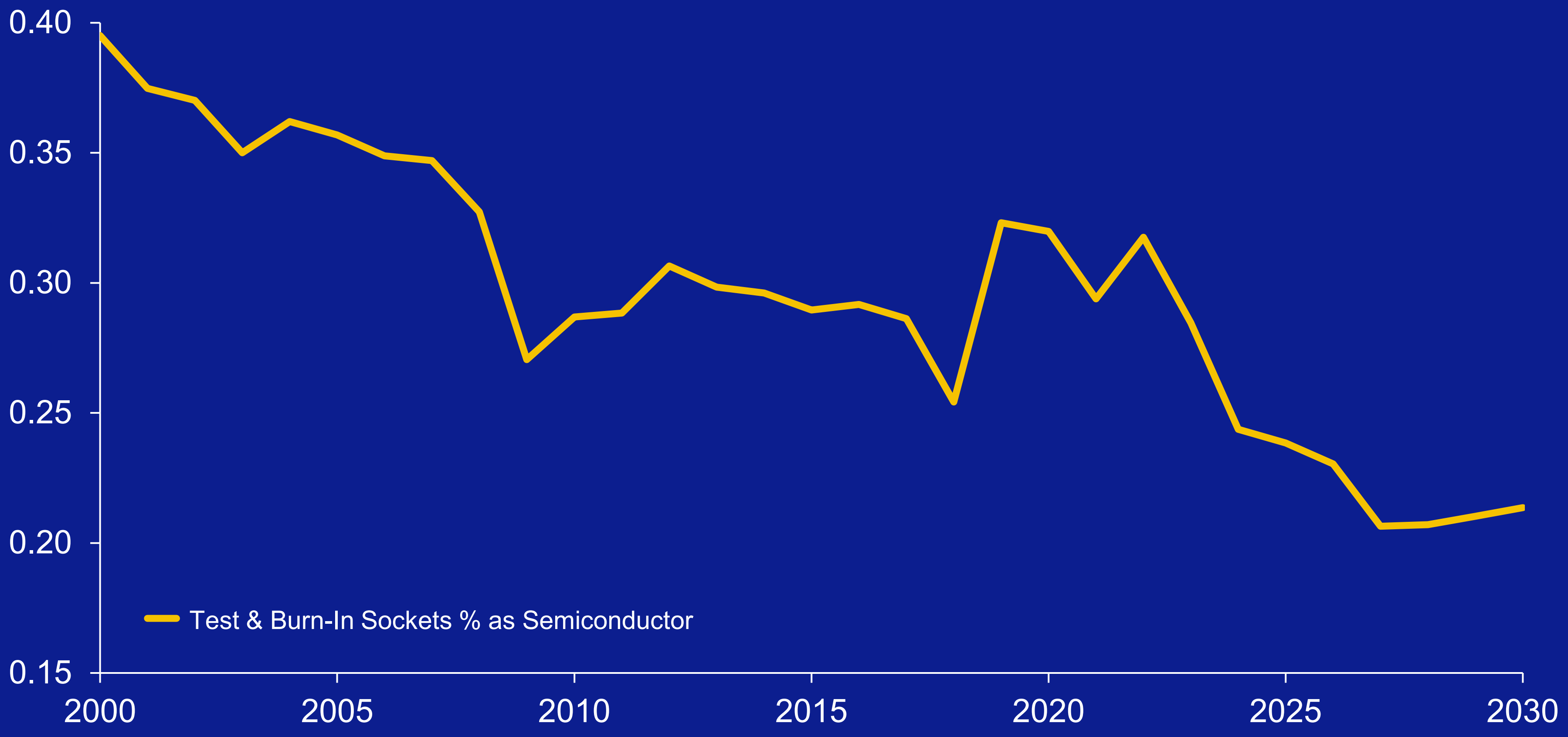
Sales relatively flat due to increased use of SLT and wafer level burn-in, and small changes in overall burn-in test times

Downturns are Rare:

Dotcom crash (2001), Financial crisis (2008/9)

Multiple factors (2023)

Test and Burn-in Socket Sales as a % of Semiconductor Revenues



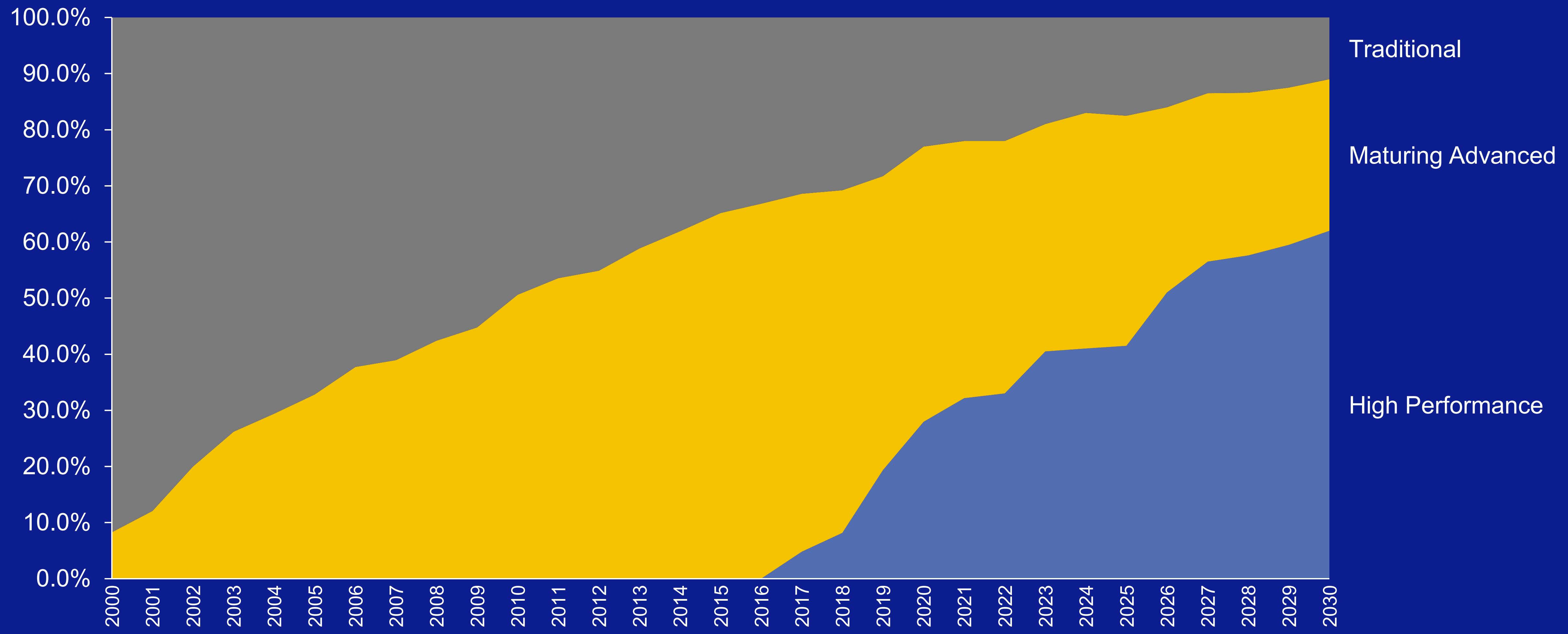
The absolute value of the test and burn-in socket market is growing…

… but test and burn-in socket sales as a % of semiconductor revenues is declining

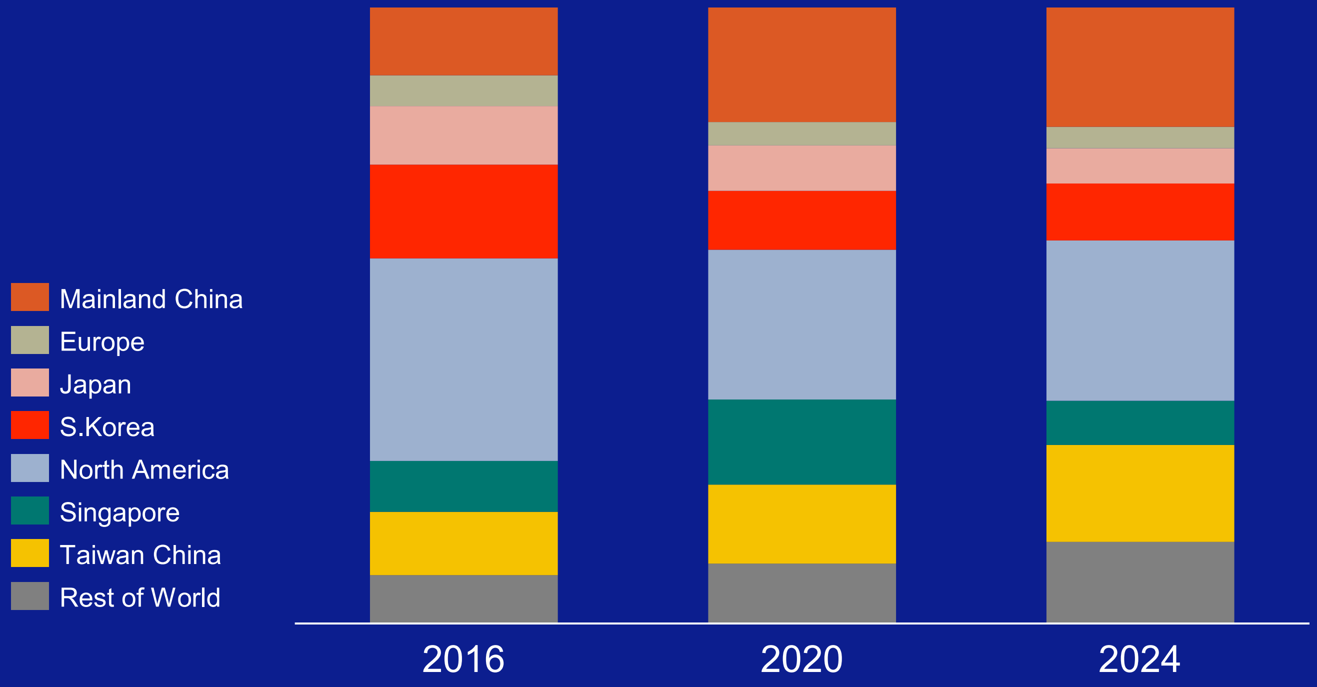
Multiple factors are in play:

- Average selling price of leading-edge semiconductors is increasing
- Overall test times are increasing
- More test at wafer sort and die sort
- More burn-in at wafer level
- Multiple die in a single package
- For leading-edge devices the cost of sockets as a % of device revenues is very low

Socket Market Shift by Package Type



Regional Distribution of Socket Sales



Key dynamics:

– Chinese vendors (as a group) is gaining market share

Challenges & Ripple Effects in AI Era

Socket Industry in AI Dominating Era

- Larger Package Size
- Higher Thermal Loads
- Massive Pin Counts
- Longer Test Time
- More complex architecture

Socket Suppliers	The need for new design within short period urge for lumpy order & causing operational difficulties.
Material Suppliers	The need for high-end materials to ensure reliability in extreme temperature, power is critical.
Process / Tool Suppliers	Long lead time in laser drilling tools could impact capacity growth
Chipmakers	Testing more complex packaging with massive pin count & pin density is time consuming & creating bottleneck in overall production flow

Conclusion

- AI to continue the domination in the industry for at least another 5 years.
- Investment in AI is driven by Fabless companies.
- Customer base changing over time.
- Leveraging expertise within the industry is crucial to stay competitive in this AI era.

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